

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: STREETWORKS

Report Number: P348863

Luminaire Tested: **ARCH-N-PA1-19-727-12VDC-T4W-HSS**

Issue Date: 3/3/2020



**Test Information**

Test Method: LM-79-08  
Report Number: P348863  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-19)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: ARCH-N-PA1-19-727-12VDC-T4W-HSS  
Description: ARCHEON ROADWAY AND AREA LUMINAIRE  
(1) 70 CRI, 2700K, 370mA LIGHT ENGINE WITH 16 LEDS AND  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 1786 lumens  
Efficiency: N/A  
Efficacy: 94.0 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.75' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B0 - U0 - G1

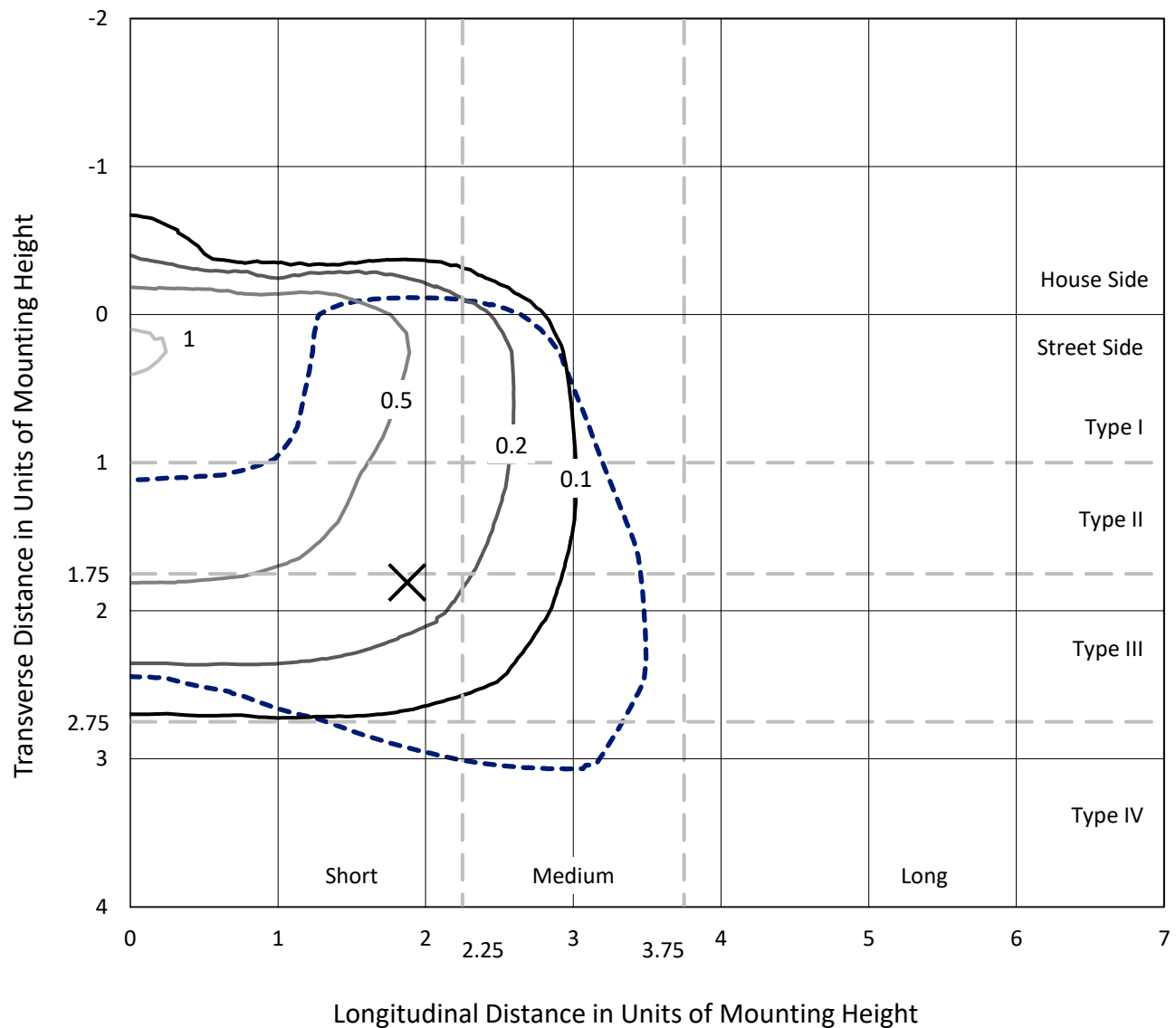
Input Watts (W): 19  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT

REPORT NUMBER: P348863

CATALOG NUMBER: ARCH-N-PA1-19-727-12VDC-T4W-HSS

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

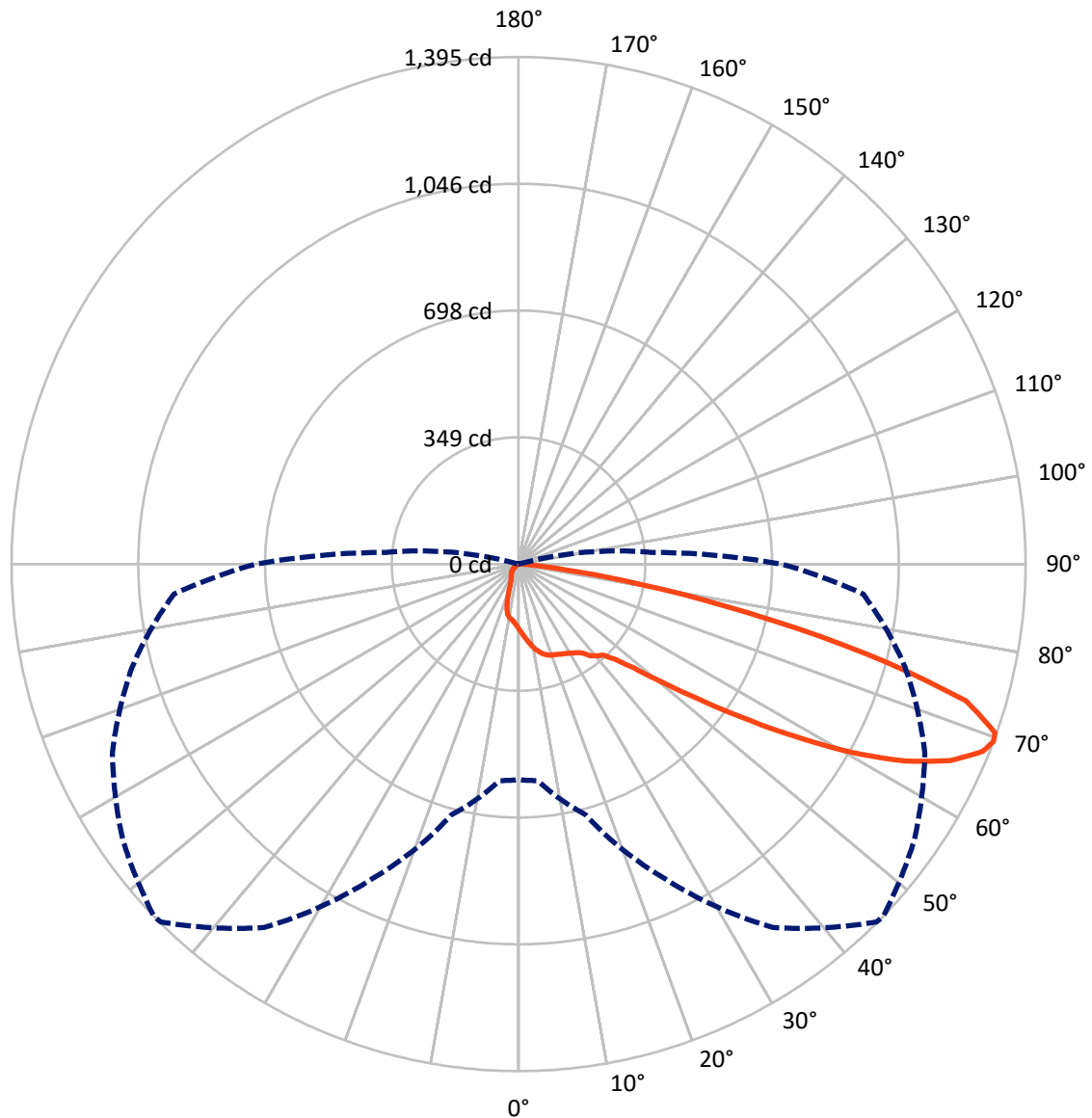


Based on 15 foot mounting height. Maximum calculated value = 1.2 fc  
 Type IV - Short - N/A

REPORT NUMBER: P348863

CATALOG NUMBER: ARCH-N-PA1-19-727-12VDC-T4W-HSS

## Luminous Intensity Polar Plot



— Vertical Plane Through 46-Deg Lateral    - - - Horizontal Cone Through 69-Deg Vertical

REPORT NUMBER: P348863

CATALOG NUMBER: ARCH-N-PA1-19-727-12VDC-T4W-HSS

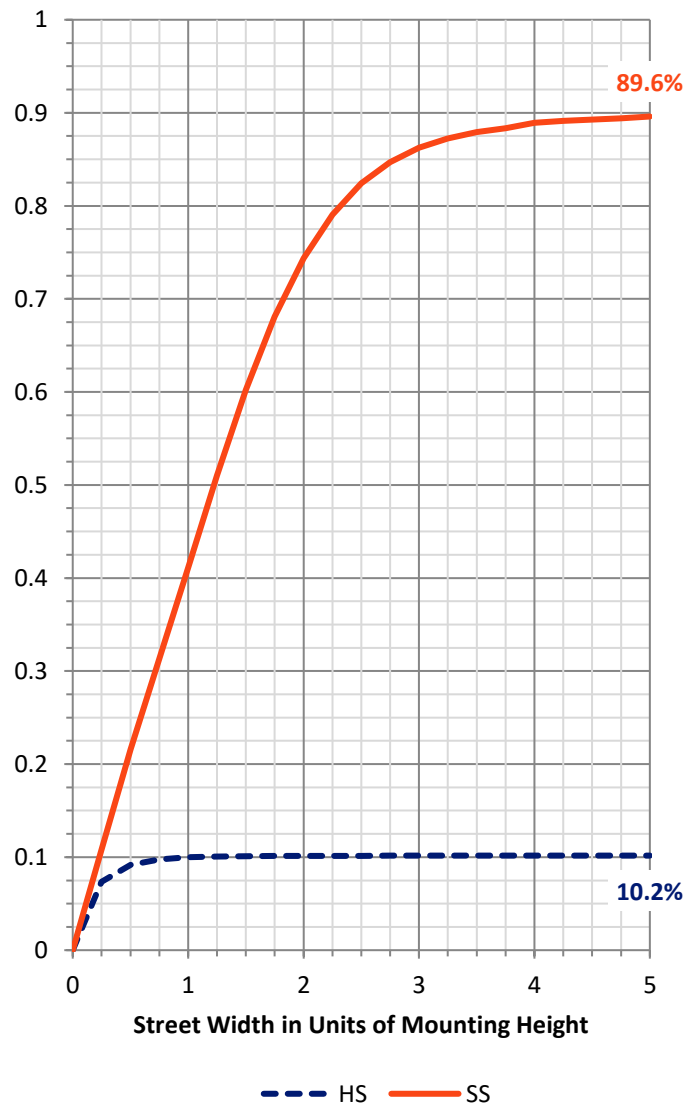
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 183.3    | 0.0    | 183.3  |
|                    | % Fixture | 10.3     | 0.0    | 10.3   |
| <b>Street Side</b> | Lumens    | 1602.7   | 0.0    | 1602.7 |
|                    | % Fixture | 89.7     | 0.0    | 89.7   |
| <b>Total</b>       | Lumens    | 1786.0   | 0.0    | 1786.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 17.8   | 1.0       |
| 10°-20°   | 54.0   | 3.0       |
| 20°-30°   | 85.0   | 4.8       |
| 30°-40°   | 121.9  | 6.8       |
| 40°-50°   | 210.6  | 11.8      |
| 50°-60°   | 416.1  | 23.3      |
| 60°-70°   | 581.6  | 32.6      |
| 70°-80°   | 281.0  | 15.7      |
| 80°-90°   | 18.1   | 1.0       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-90°    | 1786.0 | 100.0     |
| 0°-180°   | 1786.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P348863

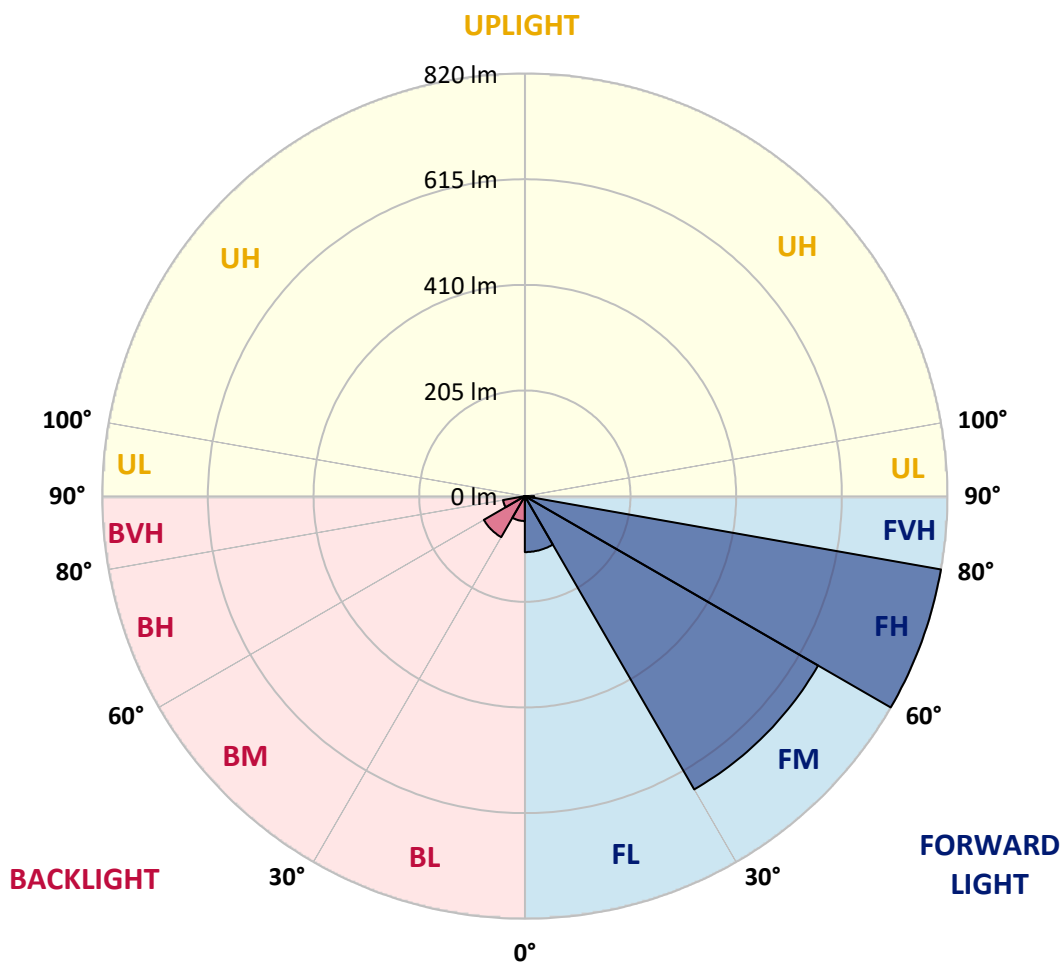
CATALOG NUMBER: ARCH-N-PA1-19-727-12VDC-T4W-HSS

**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 108.5  | 6.1       |                         |      |         |
| FM   | (30°-60°)   | 656.8  | 36.8      |                         |      |         |
| FH   | (60°-80°)   | 819.5  | 45.9      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 17.9   | 1.0       |                         |      | G1/100  |
| BL   | (0°-30°)    | 48.3   | 2.7       | B0/110                  |      |         |
| BM   | (30°-60°)   | 91.8   | 5.1       | B0/220                  |      |         |
| BH   | (60°-80°)   | 43.0   | 2.4       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 0.2    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B0-U0-G1**

Type IV Short



REPORT NUMBER: P348863

CATALOG NUMBER: ARCH-N-PA1-19-727-12VDC-T4W-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 46°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 179.0  | 179.0  | 179.0  | 179.0  | 179.0  | 179.0  | 179.0  | 179.0  | 179.0  | 179.0  | 179.0  |
| 2.5°  | 198.8  | 198.5  | 197.4  | 196.9  | 194.0  | 192.3  | 191.7  | 189.6  | 186.6  | 183.6  | 180.2  |
| 5°    | 221.4  | 221.3  | 219.1  | 217.1  | 211.7  | 206.7  | 205.7  | 200.9  | 194.1  | 187.7  | 181.4  |
| 7.5°  | 244.5  | 243.4  | 241.3  | 237.2  | 229.4  | 221.4  | 220.7  | 213.8  | 204.2  | 194.9  | 185.8  |
| 10°   | 264.1  | 263.4  | 260.6  | 254.5  | 245.4  | 236.2  | 235.3  | 226.8  | 216.0  | 204.7  | 193.0  |
| 12.5° | 279.4  | 278.9  | 275.1  | 267.5  | 257.7  | 248.3  | 247.0  | 239.5  | 227.9  | 215.2  | 201.5  |
| 15°   | 288.6  | 288.4  | 283.8  | 275.7  | 266.1  | 257.9  | 256.8  | 250.2  | 239.4  | 226.2  | 210.7  |
| 17.5° | 290.8  | 290.9  | 286.1  | 277.9  | 270.1  | 264.2  | 263.4  | 258.3  | 249.3  | 236.1  | 219.9  |
| 20°   | 286.0  | 287.0  | 282.7  | 275.6  | 270.7  | 267.6  | 267.0  | 263.9  | 256.3  | 243.9  | 227.3  |
| 22.5° | 279.1  | 279.6  | 276.7  | 271.9  | 269.9  | 270.5  | 270.1  | 268.5  | 262.0  | 250.6  | 234.6  |
| 25°   | 274.9  | 274.9  | 273.2  | 269.1  | 270.5  | 274.1  | 274.2  | 273.8  | 268.7  | 258.8  | 243.4  |
| 27.5° | 274.7  | 274.2  | 272.2  | 269.2  | 272.9  | 278.4  | 278.8  | 281.0  | 277.8  | 268.8  | 254.5  |
| 30°   | 281.4  | 280.9  | 276.6  | 272.7  | 277.3  | 283.3  | 284.1  | 289.1  | 287.5  | 279.6  | 266.8  |
| 32.5° | 297.1  | 295.0  | 285.6  | 279.1  | 282.6  | 289.7  | 290.8  | 298.7  | 301.2  | 292.9  | 278.7  |
| 35°   | 318.5  | 311.9  | 298.3  | 291.3  | 291.7  | 299.1  | 300.1  | 311.7  | 319.1  | 305.1  | 287.9  |
| 37.5° | 348.1  | 344.8  | 322.6  | 304.1  | 305.6  | 316.9  | 319.8  | 332.4  | 330.3  | 311.8  | 298.4  |
| 40°   | 412.9  | 407.8  | 384.2  | 339.7  | 318.9  | 331.3  | 332.2  | 338.9  | 339.1  | 327.0  | 320.1  |
| 42.5° | 501.2  | 499.1  | 474.2  | 404.5  | 345.1  | 340.9  | 342.6  | 353.9  | 366.5  | 359.0  | 358.7  |
| 45°   | 598.9  | 597.8  | 571.4  | 490.4  | 398.1  | 372.5  | 374.6  | 389.7  | 413.9  | 415.6  | 426.2  |
| 47.5° | 677.5  | 677.0  | 661.9  | 586.3  | 479.2  | 426.0  | 426.7  | 442.7  | 485.3  | 506.3  | 523.3  |
| 50°   | 749.2  | 751.6  | 739.7  | 690.0  | 589.8  | 509.8  | 508.2  | 518.9  | 587.3  | 621.7  | 642.8  |
| 52.5° | 848.9  | 852.3  | 818.7  | 786.8  | 705.8  | 613.8  | 612.6  | 623.8  | 709.9  | 735.6  | 739.4  |
| 55°   | 936.9  | 931.0  | 904.5  | 895.3  | 847.2  | 742.3  | 741.9  | 751.8  | 828.4  | 839.4  | 846.4  |
| 57.5° | 975.7  | 973.5  | 986.3  | 1007.4 | 995.3  | 894.1  | 893.3  | 885.8  | 934.5  | 935.7  | 957.1  |
| 60°   | 1000.3 | 1003.0 | 1042.3 | 1107.4 | 1137.4 | 1057.5 | 1052.6 | 1006.6 | 1035.9 | 1033.3 | 1056.1 |
| 62.5° | 981.8  | 987.3  | 1058.0 | 1166.4 | 1243.8 | 1200.1 | 1193.2 | 1117.3 | 1122.4 | 1113.5 | 1134.7 |
| 65°   | 884.0  | 892.5  | 1008.3 | 1155.3 | 1296.5 | 1311.5 | 1304.6 | 1215.1 | 1191.2 | 1176.5 | 1164.6 |
| 67.5° | 717.8  | 722.8  | 843.8  | 1058.4 | 1272.8 | 1378.0 | 1376.6 | 1300.7 | 1243.1 | 1165.8 | 1074.2 |
| 69°   | 593.2  | 598.1  | 714.5  | 956.4  | 1220.4 | 1392.2 | 1395.0 | 1328.2 | 1233.2 | 1101.2 | 951.8  |
| 70°   | 502.4  | 507.7  | 616.2  | 869.0  | 1159.7 | 1385.6 | 1390.6 | 1325.6 | 1204.9 | 1026.3 | 844.3  |
| 72.5° | 263.5  | 268.0  | 379.3  | 598.7  | 945.4  | 1272.3 | 1287.3 | 1213.5 | 1021.4 | 745.4  | 499.3  |
| 75°   | 82.8   | 85.4   | 148.1  | 312.9  | 647.3  | 989.3  | 992.7  | 951.9  | 725.3  | 410.0  | 207.9  |
| 77.5° | 31.6   | 30.8   | 49.3   | 115.3  | 327.3  | 622.9  | 644.0  | 594.9  | 380.6  | 145.0  | 48.0   |
| 80°   | 17.0   | 17.1   | 25.6   | 47.7   | 140.0  | 320.1  | 337.9  | 288.3  | 135.2  | 45.2   | 11.1   |
| 82.5° | 7.4    | 7.7    | 14.4   | 25.3   | 64.3   | 118.1  | 126.9  | 105.7  | 51.7   | 30.4   | 4.1    |
| 85°   | 1.6    | 1.8    | 7.0    | 13.7   | 26.2   | 33.2   | 34.8   | 34.2   | 32.9   | 23.6   | 1.6    |
| 87.5° | 0.0    | 0.0    | 3.1    | 4.9    | 6.6    | 7.5    | 6.6    | 8.6    | 18.2   | 15.9   | 0.8    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

REPORT NUMBER: P348863

CATALOG NUMBER: ARCH-N-PA1-19-727-12VDC-T4W-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°   | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 179.0 | 179.0 | 179.0 | 179.0 | 179.0 | 179.0 | 179.0 | 179.0 | 179.0 | 179.0 | 179.0 |
| 2.5°  | 179.1 | 177.6 | 175.0 | 172.2 | 170.2 | 168.1 | 166.4 | 165.6 | 164.8 | 164.2 | 165.0 |
| 5°    | 178.8 | 175.9 | 170.8 | 166.0 | 162.5 | 159.6 | 157.3 | 156.3 | 155.4 | 154.7 | 154.7 |
| 7.5°  | 181.7 | 177.6 | 169.9 | 162.8 | 157.3 | 153.5 | 150.3 | 149.0 | 147.9 | 147.4 | 147.0 |
| 10°   | 187.3 | 182.0 | 171.7 | 162.5 | 155.4 | 148.9 | 142.0 | 136.7 | 133.3 | 131.7 | 131.1 |
| 12.5° | 194.6 | 188.0 | 175.3 | 164.2 | 154.0 | 141.4 | 126.9 | 114.3 | 106.2 | 103.5 | 101.9 |
| 15°   | 203.2 | 194.9 | 179.9 | 166.5 | 148.8 | 125.9 | 101.2 | 84.7  | 77.2  | 75.7  | 74.0  |
| 17.5° | 211.4 | 202.3 | 185.4 | 166.9 | 137.4 | 100.6 | 74.1  | 63.0  | 60.0  | 61.0  | 61.3  |
| 20°   | 218.6 | 209.6 | 190.8 | 163.2 | 116.7 | 75.4  | 57.4  | 54.6  | 55.7  | 57.6  | 57.9  |
| 22.5° | 225.8 | 216.6 | 195.9 | 153.5 | 90.3  | 57.3  | 51.7  | 52.3  | 53.4  | 55.4  | 55.7  |
| 25°   | 234.7 | 225.2 | 200.6 | 135.7 | 67.7  | 48.7  | 49.1  | 50.1  | 51.2  | 52.9  | 53.1  |
| 27.5° | 244.9 | 236.0 | 203.7 | 112.5 | 50.2  | 44.8  | 45.9  | 47.4  | 48.5  | 50.2  | 50.5  |
| 30°   | 258.5 | 250.2 | 204.7 | 88.4  | 42.1  | 41.3  | 41.8  | 43.6  | 45.2  | 46.7  | 47.0  |
| 32.5° | 271.2 | 264.3 | 201.3 | 66.7  | 39.0  | 38.0  | 38.0  | 39.1  | 40.9  | 42.4  | 42.7  |
| 35°   | 283.0 | 278.4 | 190.6 | 48.8  | 36.7  | 35.0  | 34.2  | 34.2  | 35.3  | 36.5  | 36.8  |
| 37.5° | 298.4 | 298.3 | 173.3 | 38.9  | 34.4  | 32.5  | 30.7  | 29.4  | 29.0  | 29.2  | 29.4  |
| 40°   | 325.0 | 325.2 | 150.6 | 34.9  | 32.5  | 29.9  | 27.2  | 24.8  | 22.5  | 21.8  | 21.7  |
| 42.5° | 366.4 | 362.7 | 126.9 | 33.0  | 30.8  | 27.2  | 23.2  | 19.9  | 16.4  | 15.3  | 15.2  |
| 45°   | 432.3 | 409.9 | 101.8 | 31.2  | 29.1  | 24.2  | 19.2  | 14.7  | 11.9  | 11.1  | 11.1  |
| 47.5° | 528.1 | 472.0 | 78.9  | 29.3  | 26.7  | 20.8  | 14.5  | 10.6  | 8.7   | 8.3   | 8.4   |
| 50°   | 627.3 | 532.7 | 60.5  | 26.9  | 23.9  | 17.2  | 10.7  | 7.7   | 6.6   | 6.6   | 6.7   |
| 52.5° | 715.2 | 577.3 | 47.1  | 24.3  | 20.3  | 13.5  | 8.1   | 6.0   | 5.5   | 5.4   | 5.5   |
| 55°   | 797.5 | 606.0 | 36.1  | 21.3  | 16.2  | 10.0  | 6.2   | 4.9   | 4.6   | 4.4   | 4.4   |
| 57.5° | 876.9 | 620.3 | 27.0  | 17.2  | 11.7  | 7.3   | 4.9   | 4.2   | 3.9   | 3.6   | 3.5   |
| 60°   | 929.8 | 608.7 | 18.6  | 12.6  | 8.1   | 5.3   | 4.1   | 3.6   | 3.2   | 2.9   | 2.8   |
| 62.5° | 959.6 | 577.1 | 12.0  | 9.1   | 5.8   | 3.9   | 3.3   | 3.0   | 2.4   | 2.2   | 2.2   |
| 65°   | 947.5 | 525.0 | 8.4   | 6.5   | 4.2   | 2.9   | 2.4   | 2.4   | 1.8   | 1.4   | 1.3   |
| 67.5° | 839.7 | 443.6 | 6.4   | 4.9   | 3.0   | 2.2   | 1.8   | 2.1   | 1.1   | 0.7   | 0.7   |
| 69°   | 722.4 | 367.6 | 5.4   | 4.0   | 2.5   | 1.8   | 1.6   | 1.9   | 0.8   | 0.5   | 0.4   |
| 70°   | 627.9 | 317.1 | 4.9   | 3.5   | 2.1   | 1.5   | 1.4   | 1.8   | 0.8   | 0.4   | 0.3   |
| 72.5° | 375.7 | 176.9 | 3.8   | 2.5   | 1.3   | 1.2   | 1.2   | 2.1   | 0.8   | 0.4   | 0.3   |
| 75°   | 151.8 | 62.3  | 2.8   | 1.8   | 1.0   | 1.0   | 1.4   | 2.7   | 0.7   | 0.3   | 0.3   |
| 77.5° | 34.4  | 13.6  | 1.6   | 1.1   | 0.7   | 1.0   | 1.7   | 2.1   | 0.4   | 0.2   | 0.0   |
| 80°   | 8.4   | 3.3   | 1.0   | 0.7   | 0.4   | 0.8   | 1.3   | 1.2   | 0.1   | 0.0   | 0.0   |
| 82.5° | 2.8   | 1.2   | 0.4   | 0.3   | 0.1   | 0.3   | 0.6   | 0.3   | 0.0   | 0.0   | 0.0   |
| 85°   | 1.2   | 0.7   | 0.2   | 0.1   | 0.0   | 0.0   | 0.1   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 0.8   | 0.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 90°   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

STREETWORKS

Report Number: SP1-2101-121-5

Luminaire Tested: IFLD-S-SA2E-727-U-T2

Test Date: 03/04/2021

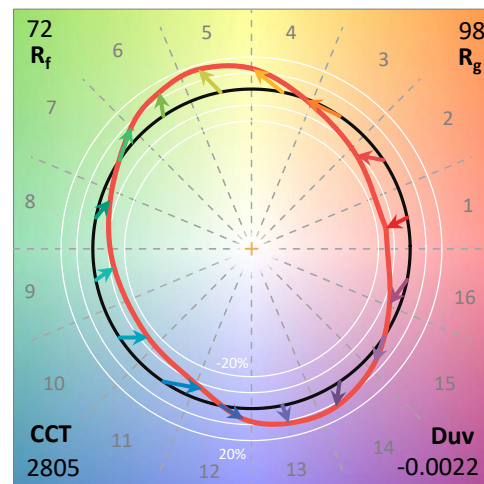
### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-5  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/04/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2E-727-U-T2**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 1500mA.

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 2805    | CRI (Ra): | 72.4 |      |       |
| CIE u':                   | 0.2586  | R1:       | 69.8 | R9:  | -15.0 |
| CIE v':                   | 0.5221  | R2:       | 81.3 | R10: | 55.6  |
| Duv:                      | -0.0022 | R3:       | 90.2 | R11: | 61.7  |
| CIE x:                    | 0.4477  | R4:       | 68.5 | R12: | 47.2  |
| CIE y:                    | 0.4017  | R5:       | 67.5 | R13: | 71.4  |
| CIE z:                    | 0.1506  | R6:       | 72.4 | R14: | 93.9  |
| Peak Wavelength (nm):     | 599     | R7:       | 79.4 |      |       |
| Dominant Wavelength (nm): | 584     | R8:       | 49.9 |      |       |
| Purity:                   | 55.3    |           |      |      |       |
| Rf:                       | 71.9    |           |      |      |       |
| Rg:                       | 97.9    |           |      |      |       |



### Test Conditions

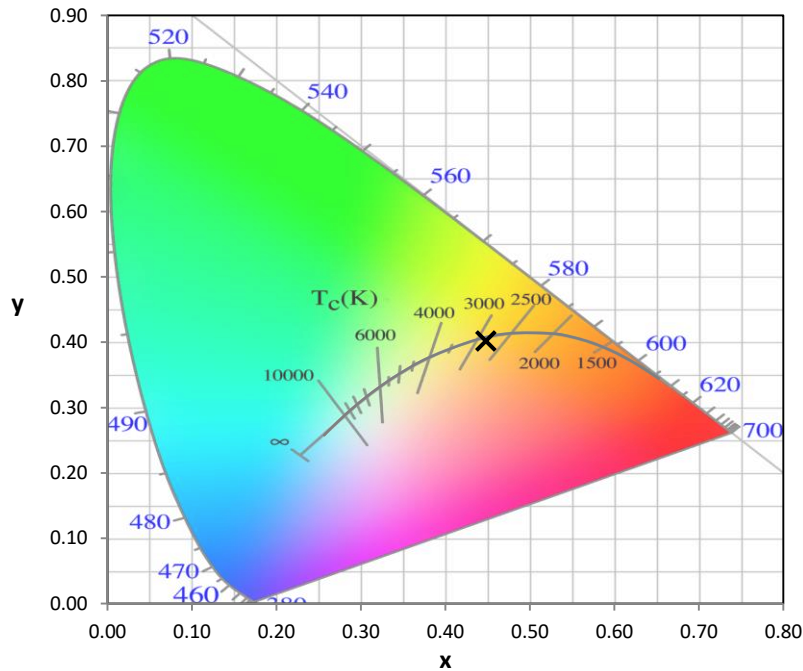
Stabilization Time: 60M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.3/31%  
 Sphere Temperature (°C): 24.8

REPORT NUMBER: SP1-2101-121-5

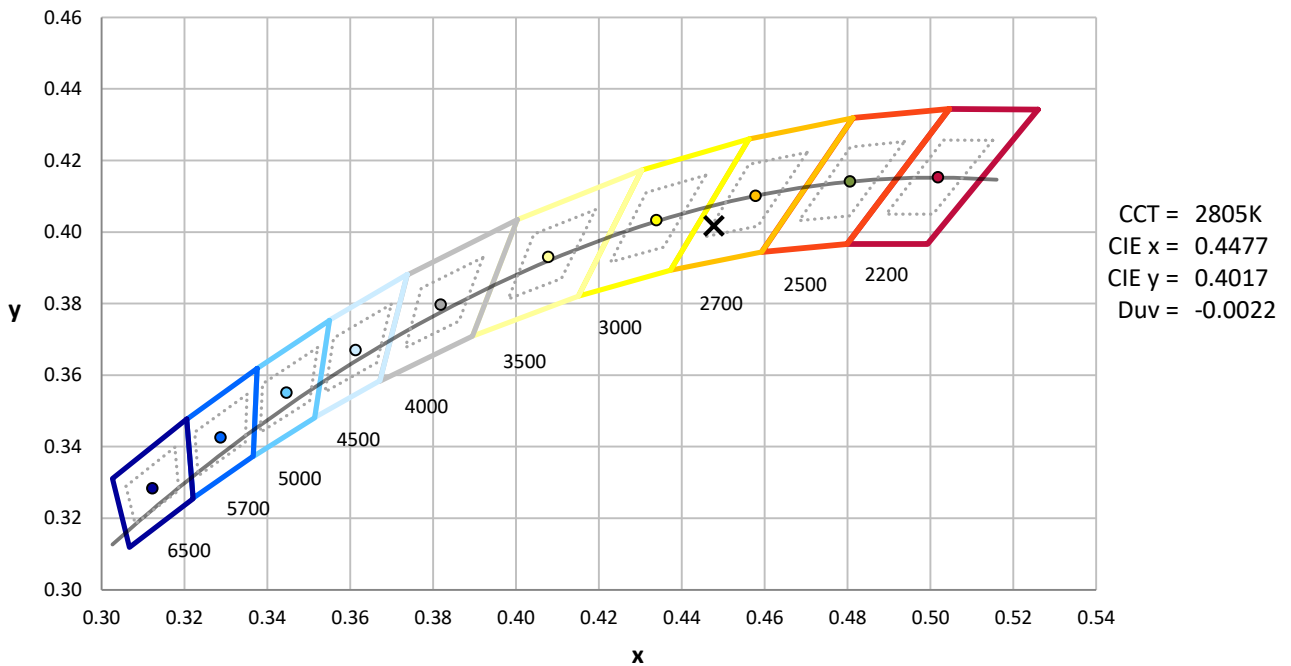
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 1/31/2021        | 7/31/2021            |
| Power Meter                    | IN0071                | 12/1/2020        | 12/1/2021            |
| AC Power Source                | IN0063                | 12/1/2020        | 12/1/2021            |
| DC Power Source                | IN0208                | 12/1/2020        | 12/1/2021            |
| Sphere Thermometer             | IN0085                | 12/1/2020        | 12/1/2021            |
| Room Thermometer               | IN0046                | 12/1/2020        | 12/1/2021            |

REPORT NUMBER: SP1-2101-121-5

**CIE 1931 Chromaticity Diagram**



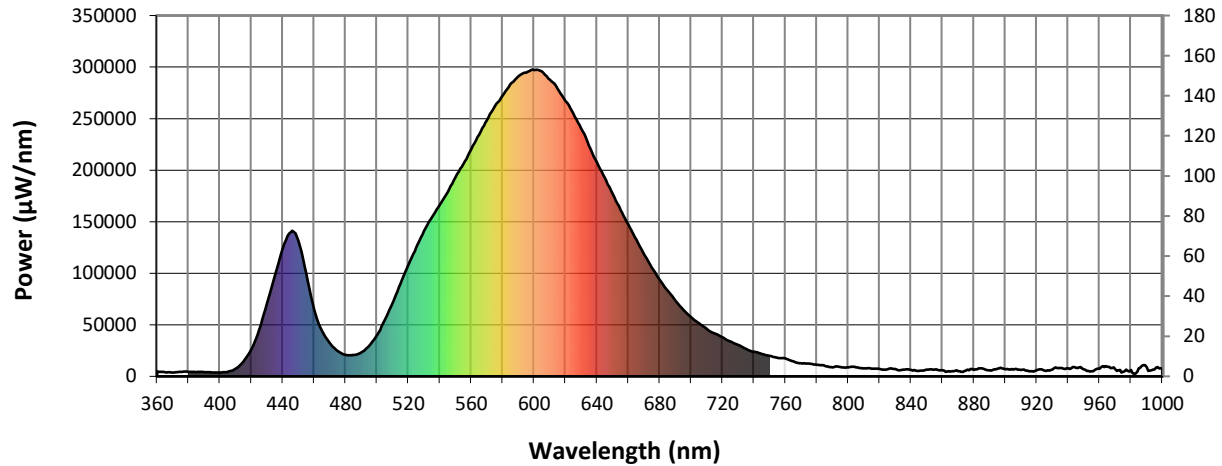
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 2700K 4-step quadrangle

REPORT NUMBER: SP1-2101-121-5

### Photopic Flux vs. Wavelength

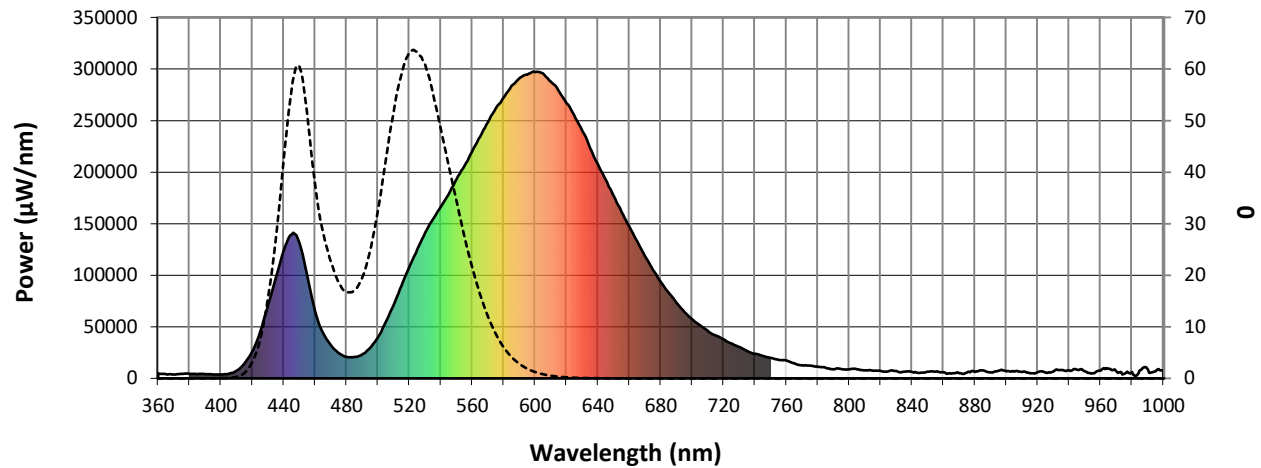


#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 4854             | 0.0              | 490       | 23280            | 3.3              | 620       | 266893           | 69.5             | 750       | 19996            | 0.0              | 880       | 6314             | 0.0              |
| 365       | 4049             | 0.0              | 495       | 29582            | 5.4              | 625       | 255096           | 56.3             | 755       | 17900            | 0.0              | 885       | 7853             | 0.0              |
| 370       | 3795             | 0.0              | 500       | 39981            | 8.8              | 630       | 240244           | 43.5             | 760       | 17272            | 0.0              | 890       | 5823             | 0.0              |
| 375       | 4296             | 0.0              | 505       | 54556            | 15.3             | 635       | 223787           | 33.6             | 765       | 14514            | 0.0              | 895       | 7346             | 0.0              |
| 380       | 4496             | 0.0              | 510       | 71364            | 24.5             | 640       | 207566           | 24.8             | 770       | 12643            | 0.0              | 900       | 6920             | 0.0              |
| 385       | 4186             | 0.0              | 515       | 89828            | 37.2             | 645       | 192517           | 18.5             | 775       | 12475            | 0.0              | 905       | 6608             | 0.0              |
| 390       | 3945             | 0.0              | 520       | 108414           | 52.6             | 650       | 177187           | 12.9             | 780       | 11188            | 0.0              | 910       | 6279             | 0.0              |
| 395       | 3780             | 0.0              | 525       | 124929           | 67.1             | 655       | 161553           | 9.3              | 785       | 10229            | 0.0              | 915       | 5131             | 0.0              |
| 400       | 3679             | 0.0              | 530       | 141352           | 83.2             | 660       | 147361           | 6.1              | 790       | 8578             | 0.0              | 920       | 5855             | 0.0              |
| 405       | 4475             | 0.0              | 535       | 154552           | 95.8             | 665       | 132756           | 4.2              | 795       | 9114             | 0.0              | 925       | 5678             | 0.0              |
| 410       | 7499             | 0.0              | 540       | 166297           | 108.4            | 670       | 118534           | 2.6              | 800       | 8597             | 0.0              | 930       | 6661             | 0.0              |
| 415       | 14449            | 0.0              | 545       | 178874           | 119.1            | 675       | 105260           | 1.8              | 805       | 8790             | 0.0              | 935       | 8074             | 0.0              |
| 420       | 26000            | 0.1              | 550       | 193176           | 131.3            | 680       | 93637            | 1.1              | 810       | 7814             | 0.0              | 940       | 7823             | 0.0              |
| 425       | 45491            | 0.2              | 555       | 206008           | 140.7            | 685       | 83217            | 0.7              | 815       | 7533             | 0.0              | 945       | 8364             | 0.0              |
| 430       | 70707            | 0.6              | 560       | 220126           | 149.6            | 690       | 73671            | 0.4              | 820       | 7303             | 0.0              | 950       | 6763             | 0.0              |
| 435       | 98169            | 1.2              | 565       | 234383           | 155.8            | 695       | 64520            | 0.3              | 825       | 6745             | 0.0              | 955       | 4883             | 0.0              |
| 440       | 123846           | 1.9              | 570       | 248161           | 161.4            | 700       | 57442            | 0.2              | 830       | 7209             | 0.0              | 960       | 7488             | 0.0              |
| 445       | 139822           | 2.9              | 575       | 261970           | 163.0            | 705       | 51479            | 0.1              | 835       | 6674             | 0.0              | 965       | 9316             | 0.0              |
| 450       | 131679           | 3.4              | 580       | 272271           | 161.8            | 710       | 45940            | 0.1              | 840       | 6151             | 0.0              | 970       | 6857             | 0.0              |
| 455       | 99242            | 3.3              | 585       | 283822           | 157.7            | 715       | 41575            | 0.0              | 845       | 5371             | 0.0              | 975       | 4388             | 0.0              |
| 460       | 65216            | 2.7              | 590       | 291192           | 150.6            | 720       | 37753            | 0.0              | 850       | 6484             | 0.0              | 980       | 6095             | 0.0              |
| 465       | 44137            | 2.3              | 595       | 294651           | 139.7            | 725       | 33818            | 0.0              | 855       | 6614             | 0.0              | 985       | 7701             | 0.0              |
| 470       | 32002            | 2.0              | 600       | 297168           | 128.1            | 730       | 30414            | 0.0              | 860       | 5959             | 0.0              | 990       | 9045             | 0.0              |
| 475       | 24549            | 1.9              | 605       | 295658           | 114.5            | 735       | 26662            | 0.0              | 865       | 4768             | 0.0              | 995       | 6989             | 0.0              |
| 480       | 20801            | 2.0              | 610       | 287633           | 98.8             | 740       | 23848            | 0.0              | 870       | 5098             | 0.0              | 1000      | 7341             | 0.0              |
| 485       | 20656            | 2.4              | 615       | 279152           | 84.3             | 745       | 21851            | 0.0              | 875       | 5516             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-5

### Scotopic Flux vs. Wavelength



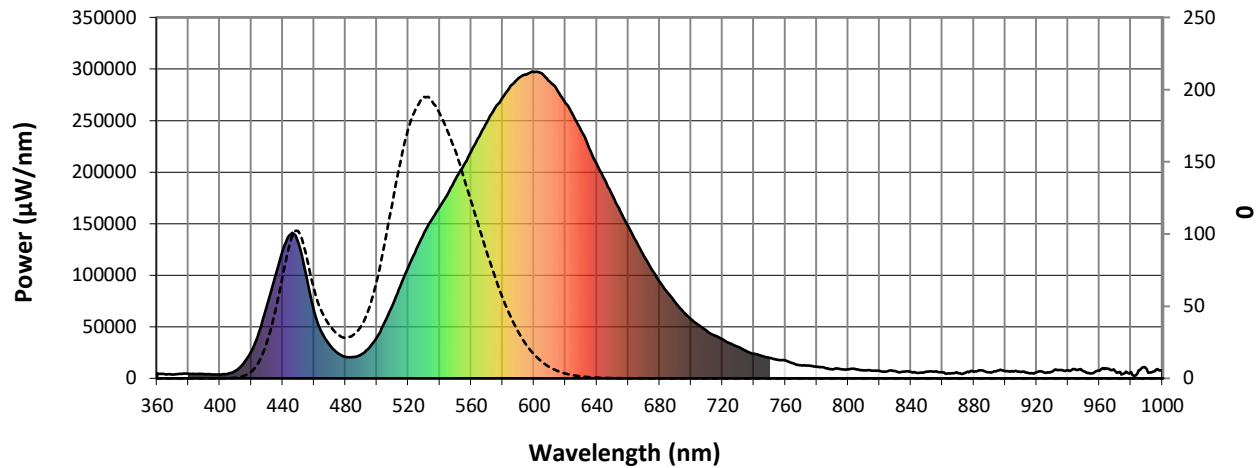
Scotopic Lumens: 15895.6

S/P: 1.11

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 4854             | 0.0              | 490       | 23280            | 35.8             | 620       | 266893           | 3.3              | 750       | 19996            | 0.0              | 880       | 6314             | 0.0              |
| 365       | 4049             | 0.0              | 495       | 29582            | 47.8             | 625       | 255096           | 2.2              | 755       | 17900            | 0.0              | 885       | 7853             | 0.0              |
| 370       | 3795             | 0.0              | 500       | 39981            | 66.9             | 630       | 240244           | 1.4              | 760       | 17272            | 0.0              | 890       | 5823             | 0.0              |
| 375       | 4296             | 0.0              | 505       | 54556            | 92.7             | 635       | 223787           | 0.9              | 765       | 14514            | 0.0              | 895       | 7346             | 0.0              |
| 380       | 4496             | 0.0              | 510       | 71364            | 121.0            | 640       | 207566           | 0.5              | 770       | 12643            | 0.0              | 900       | 6920             | 0.0              |
| 385       | 4186             | 0.0              | 515       | 89828            | 148.9            | 645       | 192517           | 0.3              | 775       | 12475            | 0.0              | 905       | 6608             | 0.0              |
| 390       | 3945             | 0.0              | 520       | 108414           | 172.3            | 650       | 177187           | 0.2              | 780       | 11188            | 0.0              | 910       | 6279             | 0.0              |
| 395       | 3780             | 0.0              | 525       | 124929           | 186.9            | 655       | 161553           | 0.1              | 785       | 10229            | 0.0              | 915       | 5131             | 0.0              |
| 400       | 3679             | 0.1              | 530       | 141352           | 194.9            | 660       | 147361           | 0.1              | 790       | 8578             | 0.0              | 920       | 5855             | 0.0              |
| 405       | 4475             | 0.1              | 535       | 154552           | 192.6            | 665       | 132756           | 0.0              | 795       | 9114             | 0.0              | 925       | 5678             | 0.0              |
| 410       | 7499             | 0.4              | 540       | 166297           | 183.8            | 670       | 118534           | 0.0              | 800       | 8597             | 0.0              | 930       | 6661             | 0.0              |
| 415       | 14449            | 1.5              | 545       | 178874           | 171.5            | 675       | 105260           | 0.0              | 805       | 8790             | 0.0              | 935       | 8074             | 0.0              |
| 420       | 26000            | 4.3              | 550       | 193176           | 158.0            | 680       | 93637            | 0.0              | 810       | 7814             | 0.0              | 940       | 7823             | 0.0              |
| 425       | 45491            | 11.1             | 555       | 206008           | 140.8            | 685       | 83217            | 0.0              | 815       | 7533             | 0.0              | 945       | 8364             | 0.0              |
| 430       | 70707            | 24.1             | 560       | 220126           | 123.0            | 690       | 73671            | 0.0              | 820       | 7303             | 0.0              | 950       | 6763             | 0.0              |
| 435       | 98169            | 43.9             | 565       | 234383           | 105.2            | 695       | 64520            | 0.0              | 825       | 6745             | 0.0              | 955       | 4883             | 0.0              |
| 440       | 123846           | 69.2             | 570       | 248161           | 87.6             | 700       | 57442            | 0.0              | 830       | 7209             | 0.0              | 960       | 7488             | 0.0              |
| 445       | 139822           | 93.6             | 575       | 261970           | 71.3             | 705       | 51479            | 0.0              | 835       | 6674             | 0.0              | 965       | 9316             | 0.0              |
| 450       | 131679           | 102.1            | 580       | 272271           | 56.1             | 710       | 45940            | 0.0              | 840       | 6151             | 0.0              | 970       | 6857             | 0.0              |
| 455       | 99242            | 86.7             | 585       | 283822           | 43.4             | 715       | 41575            | 0.0              | 845       | 5371             | 0.0              | 975       | 4388             | 0.0              |
| 460       | 65216            | 63.0             | 590       | 291192           | 32.4             | 720       | 37753            | 0.0              | 850       | 6484             | 0.0              | 980       | 6095             | 0.0              |
| 465       | 44137            | 46.6             | 595       | 294651           | 23.5             | 725       | 33818            | 0.0              | 855       | 6614             | 0.0              | 985       | 7701             | 0.0              |
| 470       | 32002            | 36.9             | 600       | 297168           | 16.7             | 730       | 30414            | 0.0              | 860       | 5959             | 0.0              | 990       | 9045             | 0.0              |
| 475       | 24549            | 30.7             | 605       | 295658           | 11.6             | 735       | 26662            | 0.0              | 865       | 4768             | 0.0              | 995       | 6989             | 0.0              |
| 480       | 20801            | 28.1             | 610       | 287633           | 7.8              | 740       | 23848            | 0.0              | 870       | 5098             | 0.0              | 1000      | 7341             | 0.0              |
| 485       | 20656            | 29.9             | 615       | 279152           | 5.2              | 745       | 21851            | 0.0              | 875       | 5516             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-5

### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 5527.7**

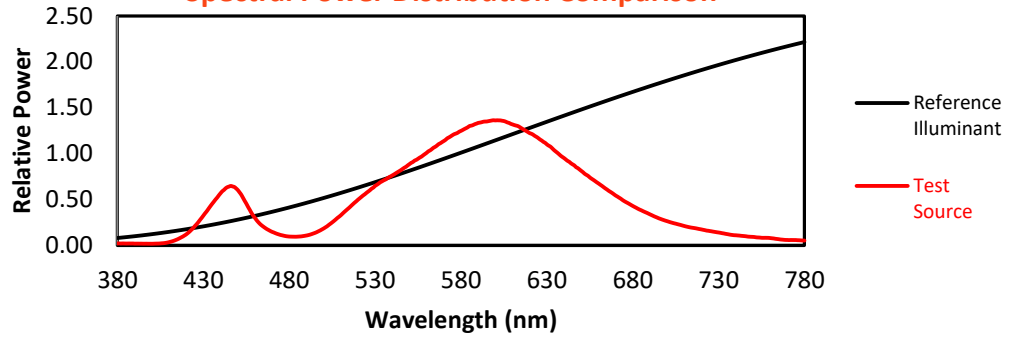
**M/P: 0.39**

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 4854             | 0.0              | 490       | 23280            | 19.4             | 620       | 266893           | 0.2              | 750       | 19996            | 0.0              | 880       | 6314             | 0.0              |
| 365       | 4049             | 0.0              | 495       | 29582            | 24.4             | 625       | 255096           | 0.1              | 755       | 17900            | 0.0              | 885       | 7853             | 0.0              |
| 370       | 3795             | 0.0              | 500       | 39981            | 32.1             | 630       | 240244           | 0.1              | 760       | 17272            | 0.0              | 890       | 5823             | 0.0              |
| 375       | 4296             | 0.0              | 505       | 54556            | 41.9             | 635       | 223787           | 0.1              | 765       | 14514            | 0.0              | 895       | 7346             | 0.0              |
| 380       | 4496             | 0.0              | 510       | 71364            | 51.2             | 640       | 207566           | 0.0              | 770       | 12643            | 0.0              | 900       | 6920             | 0.0              |
| 385       | 4186             | 0.0              | 515       | 89828            | 58.7             | 645       | 192517           | 0.0              | 775       | 12475            | 0.0              | 905       | 6608             | 0.0              |
| 390       | 3945             | 0.0              | 520       | 108414           | 63.1             | 650       | 177187           | 0.0              | 780       | 11188            | 0.0              | 910       | 6279             | 0.0              |
| 395       | 3780             | 0.0              | 525       | 124929           | 63.4             | 655       | 161553           | 0.0              | 785       | 10229            | 0.0              | 915       | 5131             | 0.0              |
| 400       | 3679             | 0.0              | 530       | 141352           | 61.1             | 660       | 147361           | 0.0              | 790       | 8578             | 0.0              | 920       | 5855             | 0.0              |
| 405       | 4475             | 0.1              | 535       | 154552           | 55.6             | 665       | 132756           | 0.0              | 795       | 9114             | 0.0              | 925       | 5678             | 0.0              |
| 410       | 7499             | 0.3              | 540       | 166297           | 48.7             | 670       | 118534           | 0.0              | 800       | 8597             | 0.0              | 930       | 6661             | 0.0              |
| 415       | 14449            | 1.0              | 545       | 178874           | 41.5             | 675       | 105260           | 0.0              | 805       | 8790             | 0.0              | 935       | 8074             | 0.0              |
| 420       | 26000            | 3.0              | 550       | 193176           | 34.7             | 680       | 93637            | 0.0              | 810       | 7814             | 0.0              | 940       | 7823             | 0.0              |
| 425       | 45491            | 7.1              | 555       | 206008           | 27.8             | 685       | 83217            | 0.0              | 815       | 7533             | 0.0              | 945       | 8364             | 0.0              |
| 430       | 70707            | 14.9             | 560       | 220126           | 21.7             | 690       | 73671            | 0.0              | 820       | 7303             | 0.0              | 950       | 6763             | 0.0              |
| 435       | 98169            | 26.2             | 565       | 234383           | 16.5             | 695       | 64520            | 0.0              | 825       | 6745             | 0.0              | 955       | 4883             | 0.0              |
| 440       | 123846           | 41.4             | 570       | 248161           | 12.1             | 700       | 57442            | 0.0              | 830       | 7209             | 0.0              | 960       | 7488             | 0.0              |
| 445       | 139822           | 55.1             | 575       | 261970           | 8.7              | 705       | 51479            | 0.0              | 835       | 6674             | 0.0              | 965       | 9316             | 0.0              |
| 450       | 131679           | 60.7             | 580       | 272271           | 6.1              | 710       | 45940            | 0.0              | 840       | 6151             | 0.0              | 970       | 6857             | 0.0              |
| 455       | 99242            | 52.0             | 585       | 283822           | 4.2              | 715       | 41575            | 0.0              | 845       | 5371             | 0.0              | 975       | 4388             | 0.0              |
| 460       | 65216            | 38.4             | 590       | 291192           | 2.9              | 720       | 37753            | 0.0              | 850       | 6484             | 0.0              | 980       | 6095             | 0.0              |
| 465       | 44137            | 28.8             | 595       | 294651           | 1.9              | 725       | 33818            | 0.0              | 855       | 6614             | 0.0              | 985       | 7701             | 0.0              |
| 470       | 32002            | 22.9             | 600       | 297168           | 1.3              | 730       | 30414            | 0.0              | 860       | 5959             | 0.0              | 990       | 9045             | 0.0              |
| 475       | 24549            | 18.7             | 605       | 295658           | 0.8              | 735       | 26662            | 0.0              | 865       | 4768             | 0.0              | 995       | 6989             | 0.0              |
| 480       | 20801            | 16.7             | 610       | 287633           | 0.5              | 740       | 23848            | 0.0              | 870       | 5098             | 0.0              | 1000      | 7341             | 0.0              |
| 485       | 20656            | 17.0             | 615       | 279152           | 0.3              | 745       | 21851            | 0.0              | 875       | 5516             | 0.0              |           |                  |                  |

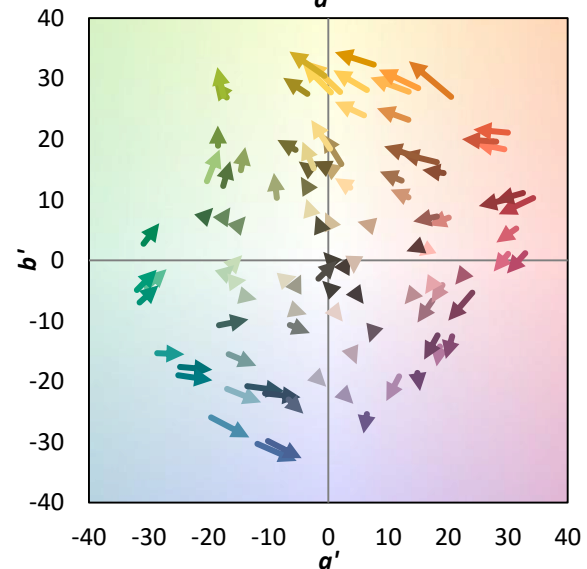
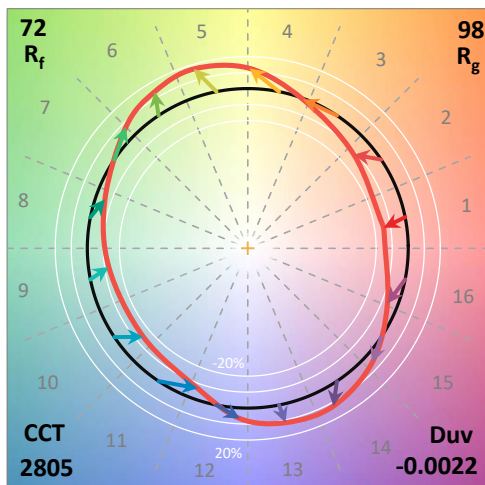
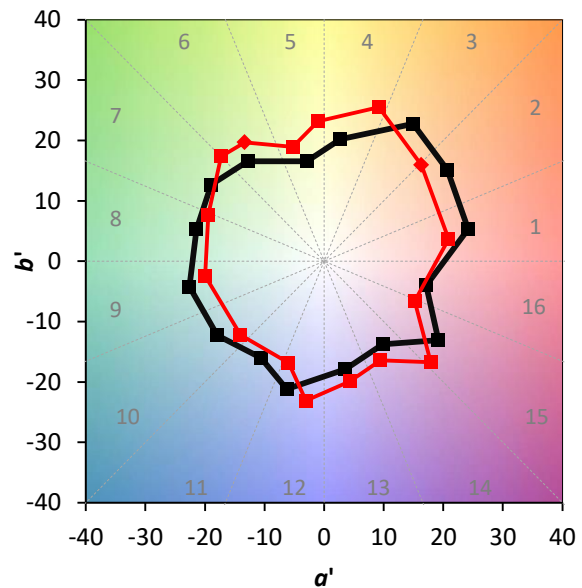
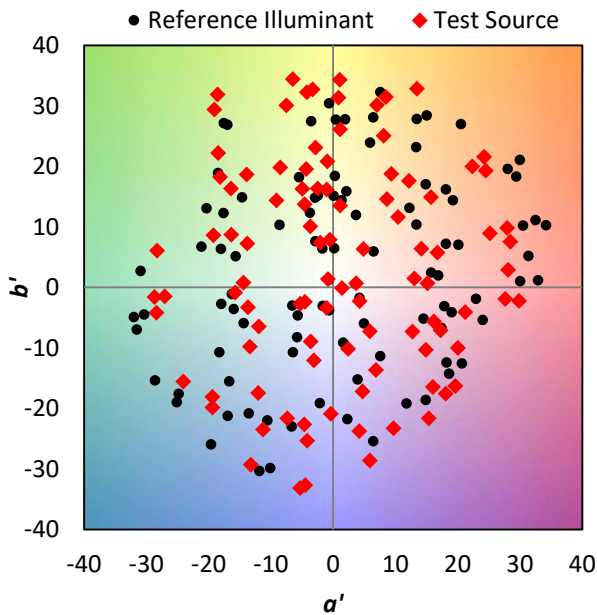
### Summary

$R_f = 71.9$   
 $R_g = 97.9$   
 CIE  $R_a = 72.4$   
 $R_g = -15.0$

### Spectral Power Distribution Comparison

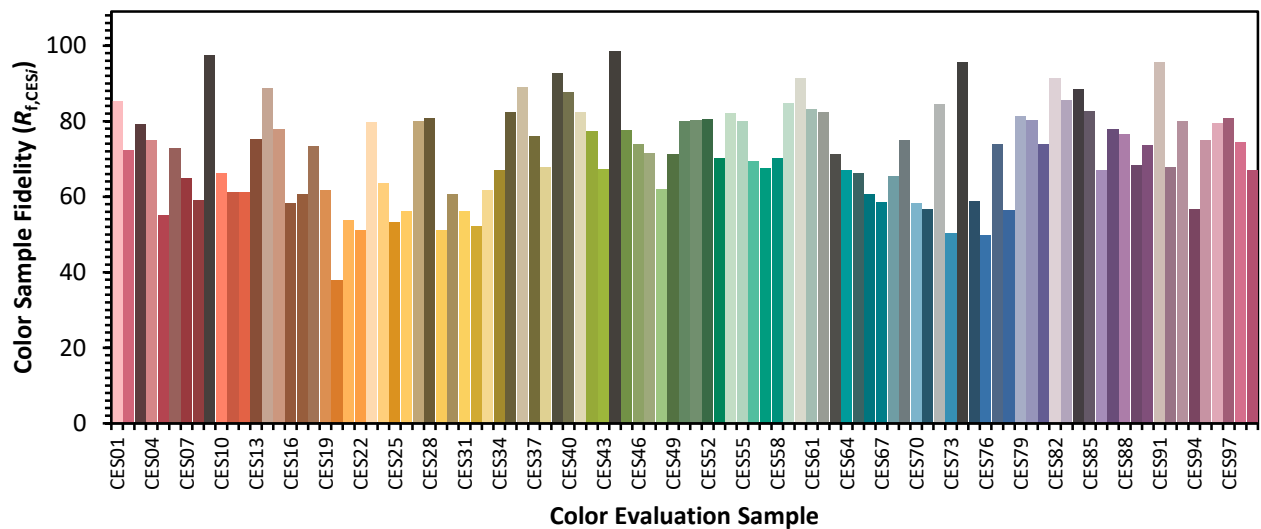


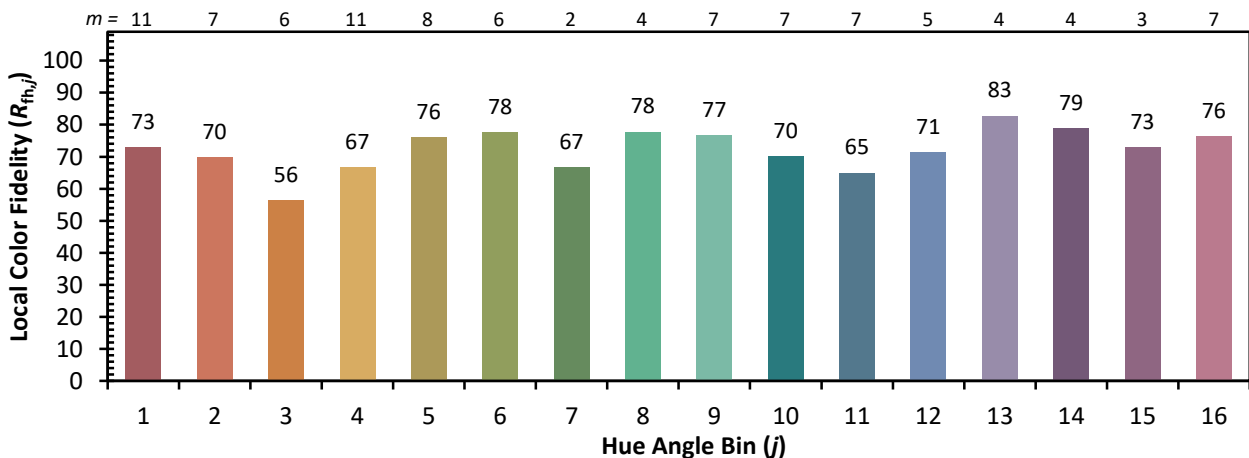
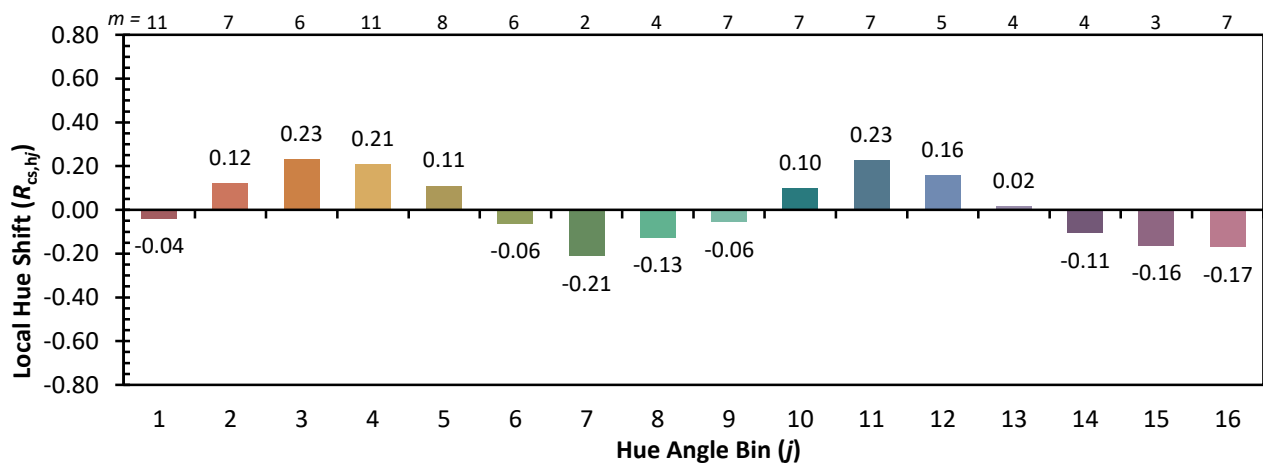
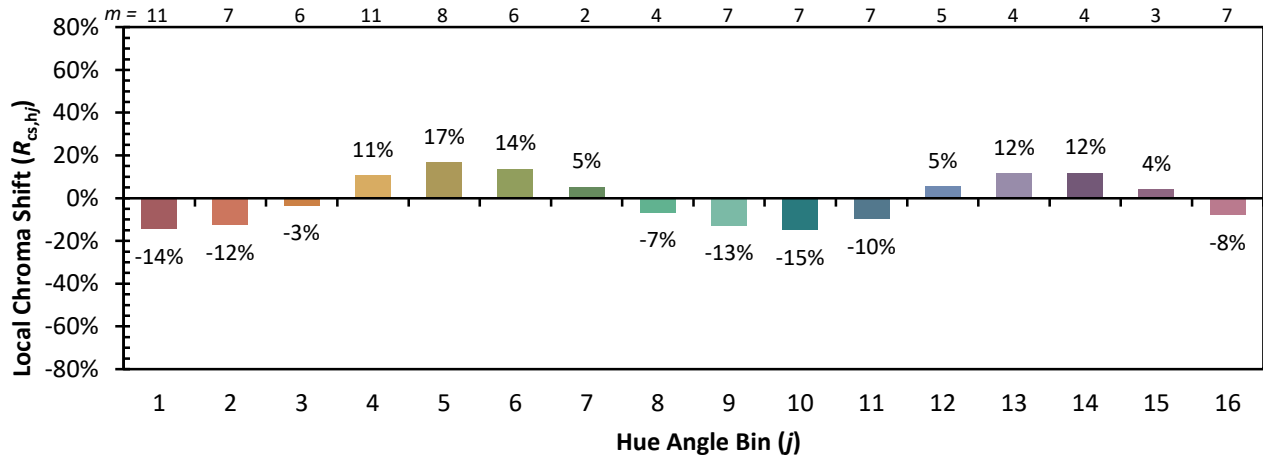
### Color Vector Graphics

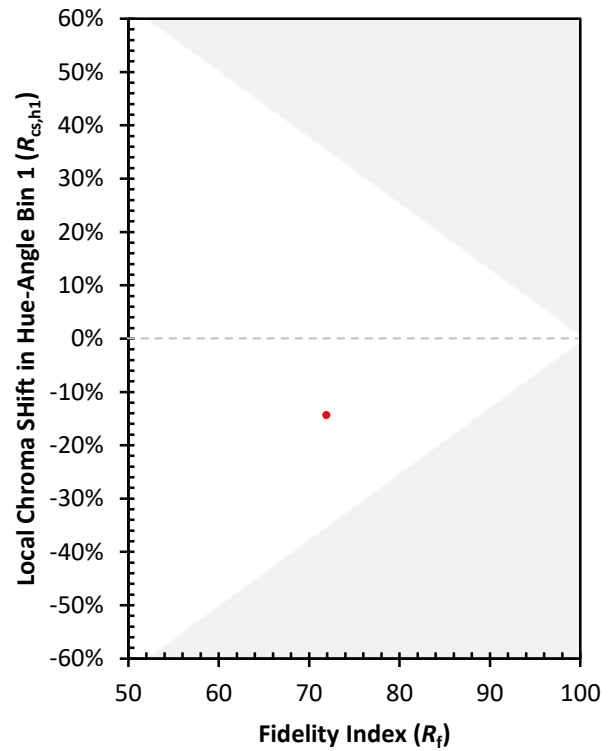
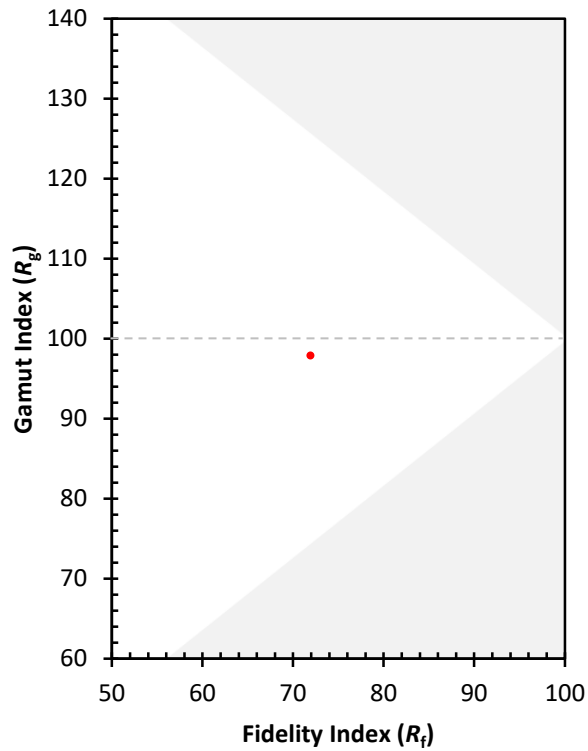


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 56 | CES51 = 80 | CES76 = 50 |
| CES02 = 63 | CES27 = 80 | CES52 = 81 | CES77 = 74 |
| CES03 = 31 | CES28 = 81 | CES53 = 70 | CES78 = 56 |
| CES04 = 71 | CES29 = 51 | CES54 = 82 | CES79 = 81 |
| CES05 = 50 | CES30 = 61 | CES55 = 80 | CES80 = 80 |
| CES06 = 52 | CES31 = 56 | CES56 = 69 | CES81 = 74 |
| CES07 = 42 | CES32 = 52 | CES57 = 67 | CES82 = 91 |
| CES08 = 41 | CES33 = 62 | CES58 = 70 | CES83 = 86 |
| CES09 = 29 | CES34 = 67 | CES59 = 85 | CES84 = 89 |
| CES10 = 76 | CES35 = 83 | CES60 = 91 | CES85 = 83 |
| CES11 = 60 | CES36 = 89 | CES61 = 83 | CES86 = 67 |
| CES12 = 66 | CES37 = 76 | CES62 = 82 | CES87 = 78 |
| CES13 = 43 | CES38 = 68 | CES63 = 71 | CES88 = 76 |
| CES14 = 74 | CES39 = 93 | CES64 = 67 | CES89 = 68 |
| CES15 = 71 | CES40 = 88 | CES65 = 66 | CES90 = 74 |
| CES16 = 48 | CES41 = 82 | CES66 = 61 | CES91 = 96 |
| CES17 = 50 | CES42 = 77 | CES67 = 58 | CES92 = 68 |
| CES18 = 57 | CES43 = 67 | CES68 = 65 | CES93 = 80 |
| CES19 = 73 | CES44 = 99 | CES69 = 75 | CES94 = 57 |
| CES20 = 67 | CES45 = 78 | CES70 = 58 | CES95 = 75 |
| CES21 = 88 | CES46 = 74 | CES71 = 57 | CES96 = 79 |
| CES22 = 80 | CES47 = 71 | CES72 = 85 | CES97 = 81 |
| CES23 = 92 | CES48 = 62 | CES73 = 50 | CES98 = 75 |
| CES24 = 91 | CES49 = 71 | CES74 = 96 | CES99 = 67 |
| CES25 = 73 | CES50 = 80 | CES75 = 59 |            |



**Color Rendition by Hue-Angle Bin**


**Measure Comparisons**


(END OF REPORT)